VER PROJECT DESIGN DOCUMENT FORM

CONTENTS

Annexes

PDD Version 06

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SECTION A. General description of small-scale project activity

A.1 Title of the small-scale project activity:

Title: Water and Energy Saving Technology WEST
Version: Version 06
Date: 12 September 2011

A.2. Description of the small-scale project activity:

The aim of the project is the diffusion of water saving kits in Switzerland. For private households, water saving kits provide one of the most economical and efficient ways of effecting CO2 reductions. The kits, manufactured by Neoperl, consist of two flow rate reducers for taps as well as a water saving valve for showerheads that will result in water savings of about 50 percent. Thus, this will reduce the annual energy consumption for hot water heating by almost half. A study of the Swiss Federal Office for Energy in 2006 (see Annex 3) showed that in Switzerland 65% of hot water is heated by fossil fuels. Reducing water consumption therefore also results in lower CO2 emissions.

However, despite this argument water saving kits still aren't the common practice and need to be promoted for mass distribution. The project will enable the beneficiaries to buy a minimum of 5,500 water saving kits at a special offer price. Through promotion days at local markets visitors are educated and advised through the project at the point of sale, as to which simple carbon offsetting measures they can take. The first special promotion days were held on 9th May 2009 at the Sursee bicycle promotion day and on 16th May 2009 in Hochdorf at the solar energy day. In total six promotion events have been conducted by myclimate's Partner 'Locher Schmill Van Wezemael & Partner AG' in 2009. myclimate's climate education department was engaged at the 'Multimobiltag 2009' in Zürich. In several articles in the print media and through campaigns in firms more people have been animated to save water. The water saving kits may also be ordered by post. Information and order forms may be accessed on the projects homepage http://www.meinklimatag.ch/. If more kits than 5500 will be sold in the future, they can be included in the project but will have a reduced crediting period.

For special events, where big quantities are sold, like promotion days or campaigns, the price for a kit is CHF 5.-. If the set is ordered by mail or via internet the price is CHF 10.- instead of the usual CHF 29.50 in super markets. The project is mainly thought for private persons, however in rare cases the kits can be installed in company or public buildings too.

The kits do not only benefit our climate but they also enable the average family to save hundreds of Swiss francs in energy costs every year. Through the project activity people are sensitized in the problematic of energy consumption through the use of hot water. The kits limit the water flow in a way that there's no significant decrease in comfort.

With the help of a web based survey, the project will be monitored over the next seven years, so that the exact CO_2 savings can be calculated. Only kits that are correctly installed in homes with fossil fuel heating will be included in the CO2 calculations.

Figure 1: The selling stand in the city of Lucerne

Figure 2: The kit and its functioning is clearly explained to interested pedestrians

In the following communities special promotion days have been organized in 2009:

Sursee	47°10'21.26"N, 8° 6'34.76"E
Hochdorf	47°12'32.54"N, 8°16'32.90"E
Lucerne	47° 2'44.36"N, 8°18'29.65"E
Sempach	47° 8'3.16"N, 8°11'35.67"E
Horw	47° 1'7.64"N, 8°18'40.92"E
Entlebuch	46°59'40.12"N, 8° 3'55.48"E
Zürich	47°22'8.49"N, 8°32'16.92"E

In the following print media the project has been announced in 2009:

- Kriens Info
- Schweizer Familie
- Umweltjournal
- Magazin der Genossenschaft abl (Allgemeine Baugenossenschaft Luzern)
- FORUM der FachFrauen Umwelt

The following companies performed campaigns to encourage their employees to purchase a water saving system for their home:

- Renggli Holzbau
- Luzerner Kantonalbank
- Stiftung Mercator
- Bau- und Mietergenossenschaft Luzern (BML)

A.3. Project participants:

Name	Function
Locher, Schmill, Van Wezemael & Partner AG Communication and Care	Project Owner
myclimate – The Climate Protection Partnership	Project developer and credit buyer

Locher, Schmill, Van Wezemael & Partner AG (LSVW) is in charge of the distribution and the monitoring of the water saving kits. They also made the pre-financing of the kits; however these kits should be paid back through carbon financing.

myclimate- The Climate Protection Partnership provided the carbon services (including PDD development) and is the purchaser of all carbon credits generated by the project activity. myclimates' climate education department is also involved in the distribution of the kits.

A.4. Technical description of the small-scale project activity:

A.4.1. Location of the small-scale project activity:

A.4.1.1. Host Party(ies):

Switzerland

A.4.1.2. Region/State/Province etc.:

All distributed sets that are installed in Switzerland are seen as part of the project. The distribution events and the campaigns in firms are mainly promoted in the states of Lucerne and Zürich.

A.4.1.3. City/Town/Community etc:

Not applicable

A.4.1.4. Details of physical location, including information allowing the unique identification of this small-scale project activity :

The project boundary is defined by the border of Switzerland.

A.4.2. Type and category(ies) and technology/measure of the small-scale project activity:

Methodology used

The project is developed following the methodology:

- AMS-II.C./Version 13: Energy efficiency improvement projects

Technical description

One kit, consist of two flow rate reducers ‘CASCADE SLC Econom’ for taps, a water saving valve ‘NEOPERL Shower Water Saver’ for showerheads, a service tool and two sealing rings.

Figure 4: Complete water saving kit

CASCADE® SLC Econom (restricted aerator)
A flow of 7 l/min with a pressure of 3 bar.

Figure 5: Tap water saver

NEOPERL® Shower Water Saver (retrofit)
Thanks to the flow regulator technology shower water savers deliver a constant flow rate of 9 liters per minute regardless of the flow pressure.

Figure 6: Shower Water Saver

Water savers ensure a constant flow regardless of the line pressure. The in the project used system leads to a water consumption of 7 liters per minute for hand washing, while taking a shower uses 9 liters. For comparison, normally installed system use 12 liters for hand washing and 18 liters for showering.

The integrated flow regulator in the Shower Water Saver is composed of a body and a dynamic O-ring. The O-ring reacts to the pressure changes and adjusts its shape to decrease the amount of water going through while the flow rate remains constant.

A service tool can be used to easily replace an aerator without damaging the chrome surface.

Source http://www.waterlimited.net/en/wl/savingwater/waterlimited.html

Figure 7: Mount an aerator

A.4.3 Estimated amount of emission reductions over the chosen crediting period:

Year	Annual estimation of emission reductions in tonnes of CO_2e
2009	**323**
2010	**1'195**
2011	**1'331**
2012	**1'331**
2013	**1'331**
2014	**1'331**
2015	**1'331**
2016	**444**
Total estimated reductions (tonnes of CO_2e)	**8'616**
Total number of crediting years	7
Annual average over the crediting period of estimated reductions (tonnes of CO_2e)	**1231**

A.4.4. Public funding of the small-scale project activity:

No public funding is involved.

A.4.5. Confirmation that the small-scale project activity is not a debundled component of a large scale project activity:

This proposed project activity is not a debundled component of another project activity as to our knowledge there is no other VER registered project activity or a request for registration by another VER project activity:

- By the same project participants;
- In the same project category and technology/measure; and
- Registered within the previous 2 years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

SECTION B. Application of a baseline and monitoring methodology

B.1. Title and reference of the approved baseline and monitoring methodology applied to the small-scale project activity:

The baseline scenario and monitoring Methodology of the proposed project activity follow the AMS-II.C, version 13.

Project Type	II:	Energy efficiency improvement projects
Project Category	II.C:	Demand-side energy efficiency activities for specific technologies

B.2 Justification of the choice of the project category:

The chosen methodology is the correct one due to the descriptions under Technology/measure in the methodology:

- Paragraph 1. The project comprises activities that encourage the adoption of energy-efficient equipment at many sites.
- Paragraph 2. For each replaced equipment the rated output or level of service (comfort and lavation in shower and/or hand washing) is not significantly smaller than in the baseline. This is checked in the monitoring survey.
- Paragraph 3 is not applicable (the project contains no refrigerants).

The project is encouraging the population to use energy efficient water savers.

B.3. Description of the project boundary:

The project boundary is the border of Switzerland. The distribution events are mainly held in the state of Lucerne. All residents of Switzerland can order a water saver set by mail and participate in the project. The boundary for each installed set is the shower or the water tap.

B.4. Description of baseline and its development:

Referring to the baseline and monitoring methodologies for selected small-scale CDM project activity categories", Type II, Category II.C. Version 13 under point 5, the energy baseline is the amount of fuel that would be used by the technology that would have been implemented without the project. The emission baseline is the energy baseline multiplied by an emission factor for the fossil fuel displaced.

$BE_y = E_y * EF$

The baseline is the amount of fossil fuels that would have been used for water heating in the absence of the project using the standard sanitary equipment available on the market (average values over the whole population are used).

Today there is little distribution of water saving kits in Switzerland. Such showers and taps with already installed water saving equipment before the project are included in the baseline scenario (figures from BFE). However, such households probably don't buy an additional system.

Due to the fact that both fossil fuels, heating oil and natural gas, are common for water heating in Switzerland, both of these fuels are considered. Water heating with electricity or other energy sources than oil and gas, like e.g. solar systems, heating pumps, wood or coal isn't included neither in the baseline nor in the project scenario.

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:

The UNFCCC's "Tool for assessment and demonstration of additionality" Version 5.2 is used here.

Step 0: Preliminary screening based on the starting date of the project activity.

In March 2009 the two managing parties 'Locher, Schmill, Van Wezemael & Partner AG' and myclimate signed an ERPA. Revenue from the sale of emission reductions have been considered from the beginning and before the project implementation and have been considered crucial for the positive project decision.

Step 1: Identification of alternatives to the project activity consistent with current laws and regulations.

Sub-step 1a: Define alternatives to the project activity:

1) Continuation of the current situation (baseline situation): only little distribution of water saving kits in households.

   Most Probable
   Review of regulatory background shows that in Switzerland there are no legally bindings to use of water saving equipments in households. The installation of such kits is not mandatory and remains a voluntary measure of individuals.
   It is likely that this situation will not change drastically in the near future (see also 3)). Nevertheless this will be covered through the monitoring of the evolving baseline.

2) Project activity carried on (distribution of kits to a reduced price) without income from the selling of carbon credits.

   Not probable
   The project owner bears a variety of costs (see investment analysis): Not only the purchase of the water saving kits, but also the coordination, management, planning, and administration costs for the distribution events as well as the costs for the monitoring constitute to the overall costs. In absence of income from carbon credit the project will not have enough money to cover these expenses. This option is economically unfeasible.

3) Voluntary purchase of water saving kits by the majority of the population to the normal price.

   Not Probable
   Experiences in the last years have shown that the relatively high price for water saving equipment in households is a barrier for a majority of the population. Still only few households in Switzerland

have installed water saving equipment. Other barriers and fears like loosing comfort are widely spread. Some people claim that a water saving system could technically not be installed in their household. Others even don't know the technology. All this barriers should be reduced with the project through promotion days, where demonstrations and education show the easy and unproblematic use of such systems.
It is unlikely that in the near future a majority of the population will voluntary swap to water saving equipment without additional promotion.

Summary
The analysis of different scenarios shows that the only possible alternative to the project is 1) Continuation of the baseline scenario. To cover changes in the baseline, the value for average water flow of Swiss standard sanitary equipment will be adopted every three years in the project monitoring (evolving baseline).

Sub-step 1b: Enforcement of applicable laws and regulations.

All proposed alternatives are compliant with current laws and regulations in Switzerland.

Step 2: Investment Analysis

Sub-step 2a: Determine appropriate analysis methods

A simple cost analysis is applied

Sub-step 2b: Option 1. Apply simple cost analysis

The proposed project activity is not economically feasible without the selling of VER certificates. The net capital loss associated with the project activity without carbon credits amounts to around CHF -500'000.- during the entire lifetime of the project. See Annex 2 for detailed information about the financial structure.
Only incomes are a donation by Neoperl of CHF 15'000 to support the monitoring expenses and the returns of the selling of the kits to a reduced price.
Main expenses are to cover the coordination, management, planning, and administration costs for the distribution events as well as the costs for the monitoring. All this tasks are needed for convincing the beneficiaries of the technology, perform capacity building and maintenance and ensure a long term sustainable outcome of the project.

The project is mainly financed through carbon crediting and economically unattractive without such income.

Step 4: Common Practice Analysis

Sub-step 4a: Analyze other activities similar to the proposed project activity

The project activity employs a new and still poorly distributed technology. In Switzerland to our knowledge, there is no other VER registered project activity or a request for registration by another VER project activity that enables the distribution of water saving equipment.

→ **The project activity is additional.**

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

For the calculation of annual emission reductions, we consider the baseline emissions minus direct project emissions and leakage. The corresponding formula is in the UNFCCC methodology AMS-II.C.
As a first step the emission reductions per installed kit/ household is calculated.

$ER_{y,i} = BE_{y,i} – PE_{y,i} – L_{y,i}$

The sum of all emissions reductions per kit is the total emission reduction of all distributed kits.

$ER_y = \sum ER_{y,i}$

ER_y Emission reduction in the year 'y' of all distributed kits
$ER_{y,i}$ Emission reduction in the year 'y' per kit "i"
$BE_{y,i}$ Baseline emission in the year 'y' per kit "i"
$PE_{y,i}$ Project emission in the year 'y' per kit "i"
$L_{y,i}$ Leakage in the year 'y' per kit "i"

B.6.2. Data and parameters which are available at validation:

Data / Parameter:	EF_i
Data unit:	$kgCO_2/kWh$
Description:	Emission factor of heating oil 'extraleicht' or natural gas used in Switzerland per kit
Source of data used:	Bundesamt für Umwelt BAFU Schweiz http://www.bafu.admin.ch/klima/09608/index.html
Value applied:	0.265 for users with oil heating 0.198 for users with natural gas heating
Justification of the choice of data or description of measurement methods and procedures actually applied :	Heating oil: 73.7 tCO2/TJ / 1000 * 3.6MJ/kWh Using the net calorific value (NCV, 'unterer Heizwert' HU), 10kWh/$l_{HO\ EL}$ as recommended by BAFU. Natural gas: 55 tCO2/TJ / 1000 *3.6MJ/kWh Using the calorific value (CV, 'Brennwert' HO), 10.1 kWh/Nm^3 as recommended by BAFU (in Switzerland gas heating is more likely equipped with flue gas condensation than oil heating).
Any comment:	Local value is applied.

Data / Parameter:	**c**
Data unit:	kWh/(°K l)
Description:	Volumetric heat capacity of water
Source of data used:	Renewable energy: M.Kaltschmitt, W. Streicher, A. Wiese: Springer Verlag 2007, ISBN 978-3-540-70974-3, p.140

Value applied:	0.00116
Justification of the choice of data or description of measurement methods and procedures actually applied :	1.16 KWh/(m^3 °K) See also as justification: http://en.wikipedia.org/wiki/Specific_heat_capacity 4.1796 J/(cm^3·°K) = 4179.6 J/(°K*l) = 0.0041796 MJ/(°K*l) 3.6 MJ= 1 kWh 0.0041796 MJ/(°K*l) / 3.6 MJ/kWh = 0.001161 kWh/(°K*l)
Any comment:	

Data / Parameter:	ΔT
Data unit:	°K
Description:	Difference of temperature between cold and hot water
Source of data used:	In various sources hot water temperatures for shower and tap between 37° and 40°C can be found. Calculating with 37°C is conservative. For cold tap water all found sources claim for 10°C. http://www.aquaclic.ch/492.0.html http://www.dereinsparshop.de/berechnungsgrundlagen.html http://www.schweizerfamilie.ch/umwelt/wissen/wohnen-heizen-duschen-39762
Value applied:	27
Justification of the choice of data or description of measurement methods and procedures actually applied :	Conservative assumption that the cold water has 10°C and the used hot water has 37°C.
Any comment:	

Data / Parameter:	η
Data unit:	-
Description:	Efficiency of heating
Source of data used:	http://www.lueftungsbau.ch/heizgeraete.htm http://www.tinner-heizungen.ch/gasheizungen.htm
Value applied:	100%
Justification of the choice of data or description of measurement methods and procedures actually applied :	Modern oil and gas heating reach a degree of efficiency close to 100%, where older heating lays around 85-95%. No actual average efficiency values for Switzerland could be found. The efficiency will increase in the future, coming closer to 100%. Choosing 100% is a conservative approach.
Any comment:	

Data / Parameter:	$Q_{Pr\ Sh}$
Data unit:	l/min
Description:	Flow of shower water in the project scenario
Source of data used:	Neoperl
Value applied:	9
Justification of the choice of data or description of	Value of the datasheet of the producer.

measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	$Q_{Pr\ Tap}$
Data unit:	l/min
Description:	Flow of tap water in the project scenario
Source of data used:	Neoperl
Value applied:	7.5
Justification of the choice of data or description of measurement methods and procedures actually applied :	Value of the datasheet of the producer.
Any comment:	

Data / Parameter:	$n_{days\ per\ a}$
Data unit:	-
Description:	Number of days per year minus holidays
Source of data used:	
Value applied:	336
Justification of the choice of data or description of measurement methods and procedures actually applied :	364 days minus (4 * 7 days)
Any comment:	

Data / Parameter:	$n_{Pers\ per\ Kit,i}$
Data unit:	
Description:	Number of persons per kit
Source of data to be used:	User survey
Value of data	
Description of measurement methods and procedures to be applied:	In the user survey the representative sample of randomly selected users will be asked the following question: *'How many persons in your household do use the kit?*'
QA/QC procedures to be applied:	The answers of the survey flow into an automatically generated excel sheet. LSVW will do the collection of the data. myclimate will verify this data and support LSVW with the statistical analyses.
Any comment:	
Data / Parameter:	$n_{Sh\ per\ a,i}$
Data unit:	
Description:	Average number of showers per kit per person per annum
Source of data to be used:	User survey
Value of data	
Description of measurement methods and procedures to be applied:	In the user survey the representative sample of randomly selected users will be asked the following question: *'How many showers a week do the users of the kit in your household take in average?'*

	$n_{Sh\ per\ week}$ has to be multiplied by 48 weeks, assuming 4 weeks of holiday to get $n_{Sh\ per\ a}$.
QA/QC procedures to be applied:	The answers of the survey flow into an automatically generated excel sheet. LSVW will do the collection of the data. myclimate will verify this data and support LSVW with the statistical analyses.
Any comment:	

Data / Parameter:	$t_{Sh,i}$
Data unit:	*Min*
Description:	Average length of use of shower per kit per person
Source of data to be used:	User survey
Value of data	
Description of measurement methods and procedures to be applied:	In the user survey users will be asked the following question: *'How long do the users of the kit in your household take a shower in average?'*
QA/QC procedures to be applied:	The answers of the survey flow into an automatically generated excel sheet. LSVW will do the collection of the data. myclimate will verify this data and support LSVW with the statistical analyses.
Any comment:	

Data / Parameter:	$t_{Tap,i}$
Data unit:	*Min*
Description:	Average time of use of tap hot water per person per day
Source of data to be used:	Repeated user survey autumn 2011
Value of data	
Description of measurement methods and procedures to be applied:	For more information see Annex 6.
QA/QC procedures to be applied:	LSVW does the collection of the data. myclimate verifies this data and support LSVW with the statistical analyses.
Any comment:	

Data / Parameter:	n_{sample}
Data unit:	
Description:	Sample size for user survey
Source of data to be used:	User survey
Value applied for user survey:	222
Description of measurement methods and procedures to be applied:	See B.6.4.1 Ex-ante emission reduction B.7.2 and Annex 5 User survey.
QA/QC procedures to be applied:	LSVW will do the collection of the data and the maintenance of the sales record. myclimate will verify this data.
Any comment:	

B.6.3 Ex-ante calculation of emission reductions:

For the calculation of annual emission reductions due to the project activity, baseline emissions minus direct project emissions and emissions induced by leakage are considered.

Formula		
$ER_y = BE_y - PE_y - L_y$ *(from B.6.1)*		
	Description	**Reference**
ER_y	*Emission reductions during the year y [t CO_2-eq.]*	
BEy	*Baseline emissions during the year y [t CO_2-eq.]*	*Section B.6.3.1*
PE_y	*Project emissions during the year y [t CO_2-eq.]*	*Section B.6.3.2*
L_y	*Project leakage during the year y [t CO_2-eq.]*	*Section B.6.3.3*

B.6.3.1 Baseline Emissions

The baseline emission per kit is given through:

$BE_{y,i} = E_{BL,y,i} * EF_i$

$$E_{BL,y,i} = \frac{V_{BL,H2O} * c * \Delta T}{\eta}$$

$V_{BL\ H2O} = n_{Pers\ per\ Kit} * Q_{BL\ Sh} * t_{Sh} * n_{Sh\ per\ a} + n_{Pers\ per\ Kit} * Q_{BL\ Tap} * t_{Tap} * n_{days\ per\ a}$

$$BE_{y,i} = c * \Delta T * n_{Pers\ per\ Kit,i} * \frac{EF_i}{\eta} * \left(Q_{BL\ Sh} * t_{Sh,i} * n_{Sh\ per\ a,i} + Q_{BL\ Tab} * t_{Tab,i} * n_{days\ per\ a}\right)$$

where:

$BE_{y,i}$	baseline emission per year "y" per kit in absence of the project activity [$kgCO_2$]
$E_{BL,y}$	energy consumption in the year "y" in absence of the project activity [kWh]
EF_i	emission factor for heating oil or natural gas per kit [$kgCO_2$/kWh]
$V_{BL\ H2O}$	Used warm water in the absence of the project [l]
c	volumetric heat capacity of water [kWh/(°K*l)]
ΔT	Difference of temperature between cold and hot water [°K]
η	Efficiency of oil or gas heating
$Q_{BL\ Sh}$	Average flow of shower water in the absence of the project [l/min]
$Q_{BL\ Tap}$	Average flow of tap water in the absence of the project [l/min]
$n_{Pers\ per\ Kit,i}$	Number of persons per kit
$n_{Sh\ per\ a,i}$	Average number of showers per person per kit per year
$n_{days\ per\ a}$	Number of days per year minus holidays
$t_{Sh,i}$	Average length of use of shower per person per kit [min]
$t_{Tap,i}$	Average time of use of tap hot water per person per day per kit [min]

B.6.3.2 Project Emissions

The project emission per kit is given through:

$PE_{y,i} = E_{Pr,y,i} * EF_i$

$$E_{Pr,y,i} = \frac{V_{Pr,H2O} * c * \Delta T}{\eta}$$

$V_{Pr\ H2O} = n_{Pers\ per\ Kit} * Q_{Pr\ Sh} * t_{Sh} * n_{Sh\ per\ a} + n_{Pers\ per\ Kit} * Q_{Pr\ Tap} * t_{Tap} * n_{days\ per\ a}$

$$PE_{y,i} = c * \Delta T * n_{Pers\ per\ Kit,i} * \frac{EF_i}{\eta} * \left(Q_{Pr\ Sh} * t_{Sh,i} * n_{Sh\ per\ a,i} + Q_{Pr\ Tab} * t_{Tab,i} * n_{days\ per\ a}\right)$$

where:

$PE_{y,i}$	project emission per kit per year "y" [$kgCO_2$]
$E_{Pr,y,i}$	total project energy consumption in the year "y" [kWh]
EF_i	emission factor for heating oil or gas per kit [$kgCO_2$/kWh]
$V_{Pr\ H2O}$	Used warm water in the project in the year 'y'[l]
c	volumetric heat capacity of water [kWh/(°K*l)]
ΔT	Difference of temperature between cold and hot water [°K]
η	Efficiency of oil or gas heating
$Q_{Pr\ Sh}$	Average flow of shower water in the project [l/min]
$Q_{Pr\ Tap}$	Average flow of tap water in the project [l/min]
$n_{Pers\ per\ Kit,i}$	Number of persons per kit
$n_{Sh\ per\ a,i}$	Average number of showers per person per kit per year
$n_{days\ per\ a}$	Number of days per year minus holidays
$t_{Sh,i}$	Average length of use of shower per person per kit [min]
$t_{Tap,i}$	Average time of use of tap hot water per person per day per kit [min]

B.6.3.3 Leakage

In this project no significant indirect emissions could be identified. All possible sources for leakage like emissions through the production of the kit, the transportation of the kit, the installation of the kit and the disposal of the old equipment are negligible. Therefore we assume

$L_{y,i} = 0$

B.6.4 Summary of the ex-ante estimation of emission reductions:

B.6.4.1 Ex-ante emission reduction

To calculate the emission reduction of all distributed kits ER_y for the year y, a user survey has been performed with a randomly selected sample of users. The sample size n_{sample} has to be bigger than 3% of all distributed kits $n_{distributed\ kits}$.

- $n_{distributed\ kits} = 5500$

- n_{sample} = 222

To get groups with normal distributed emission reductions, the whole sample of users has to be divided in four clusters with the same level of installation. The four clusters are:

- **Cluster tap sh**: Households with fossil heating that have both installed the shower saver and at least one tap valve.
- **Cluster tap only**: Households with fossil heating that have only at least one tap valve installed but not the shower saver.
- **Cluster sh only**: Households with fossil heating that have installed only the shower saver but no tap valve.
- **Cluster NA**: Households that haven't installed any of the project equipment or do not have fossil heating or claim a drastically decrease in comfort or don't reply in a correct manner.

Count the cluster size for each cluster:

- $n_{tap\ sh}$ = 63
- $n_{tap\ only}$ = 29
- $n_{sh\ only}$ = 6
- n_{NA} = 124

The emission reduction per kit is given through:

$ER_{y,i} = BE_{y,i} - PE_{y,i} - L_{y,i}$

For the cluster tap sh:

$$ER_{y,i,tabsh} = c * \Delta T * n_{Pers\,per\,Kit,i} * \frac{EF_i}{\eta} * \begin{pmatrix} (Q_{BL\ Sh} * t_{Sh,i} * n_{Sh\,per\,a,i} + Q_{BL\ Tab} * t_{Tab,i} * n_{days\,per\,a}) \\ -(Q_{Pr\ Sh} * t_{Sh,i} * n_{Sh\,per\,a,i} + Q_{Pr\ Tab} * t_{Tab,i} * n_{days\,per\,a}) \end{pmatrix}$$

For the cluster tap only:

$$ER_{y,i,tabonly} = c * \Delta T * n_{Pers\,per\,Kit,i} * \frac{EF_i}{\eta} * ((Q_{BL\ Tab} * t_{Tab,i} * n_{days\,per\,a}) - (Q_{Pr\ Tab} * t_{Tab,i} * n_{days\,per\,a}))$$

For the cluster sh only:

$$ER_{y,i,shonly} = c * \Delta T * n_{Pers\,per\,Kit,i} * \frac{EF_i}{\eta} * ((Q_{BL\ Sh} * t_{Sh,i} * n_{Sh\,per\,a,i}) - (Q_{Pr\ Sh} * t_{Sh,i} * n_{Sh\,per\,a,i}))$$

For the cluster NA:

$$ER_{y,i,NA} = 0$$

In a next step, the lower limit of a one-sided 90% confidence interval of all emission reductions per kit for each cluster is calculated to get the average emissions reductions per kit in this cluster:

- $ER_{y,avg.per\ kit,\ tap\ sh.}$ = 0.72612 $tCO_{2\ eq}$
- $ER_{y,\ avg.per\ kit,\ tap\ only.}$ = 0.25855 $tCO_{2\ eq}$

- $ER_{y,\ avg.per\ kit,\ sh\cdot only} = 0.08041\ tCO_{2eq}$
- $ER_{y,\ avg.per\ kit,\ NA} = 0\ tCO_{2eq}$

The total emission reduction of the project in the year y can then be calculated through:

$$ER_y = \frac{n_{distributedkits}}{n_{sample}}\left(ER_{y,avgperkittabsh} * n_{tabsh} + ER_{y,avgperkittabonly} * n_{tabonly} + ER_{y,avgperkitshonly} * n_{shonly} + 0\right)$$

Vintage	Total distributed kits (% of 5500)	Project Emission Reduction (t CO_2-eq.)
2009	24.24%	**323**
2010	89.77%	**1'195**
2011	100.00%	**1'331**
2012	100.00%	**1'331**
2013	100.00%	**1'331**
2014	100.00%	**1'331**
2015	100.00%	**1'331**
2016	33.33%	**444**
Total		**8'616**
Average		1230.923

B.7 Application of a monitoring methodology and description of the monitoring plan:

Monitoring is applied following to the CDM Small-Scale Methodology AMS-II.C./Version 13: Energy efficiency improvement projects.

- Paragraph 12: In this point the project differs from the methodology. Replaced devices are not recorded to verify the Baseline (this paragraph is more reasonable for efficient lamps).
- Paragraph 13: not applicable (no electricity is used)
- Paragraph 14: the monitoring includes annual checks of a sample of non-metered systems to ensure that they are still operating.
- Paragraph 15: not applicable (no electricity is used)
- Paragraph 16: not applicable (no pumping system is used)

To calculate the emission reduction further data has to be monitored for this project.

B.7.1 Data and parameters monitored:

All the following data will be monitored in a web based survey, calculated out of the sales record or identified out of studies and/or publications:

Data / Parameter:	$Q_{BL\ Sh}$
Data unit:	l/min
Description:	Average flow of shower water in the absence of the project in Switzerland
Source of data used:	BFE, Bundesamt für Energie, Schweiz Wasserspass für Körper, Geist und Klima.pdf Justification: http://www.aquaclic.ch/492.0.html tells of 15-25l/min for regular showerheads, thus 18 l/min is conservative.
Value applied for first 3 years:	18
Description of measurement methods and procedures to be applied:	This value will be renewed every two years (evolving baseline) by identifying it in actual reliable studies and/or publications (preferable from BFE).
QA/QC procedures to be applied:	At least two sources have to be named for justification of the value. Always the lower value has to be chosen to be conservative.
Any comment:	

Data / Parameter:	$Q_{BL\ Tap}$
Data unit:	l/min
Description:	Average flow of tap water in the absence of the project in Switzerland
Source of data used:	BFE, Bundesamt für Energie, Schweiz Wasserspass für Körper, Geist und Klima.pdf Justification: http://www.schweizerfamilie.ch/umwelt/wissen/wohnen-heizen-duschen-39762 tells of 10-17 l/min, thus 12 l/min is conservative.
Value applied for first 3 years:	12
Description of measurement methods and procedures to be applied:	This value will be renewed every two years (evolving baseline) by identifying it in actual reliable study and/or publication (preferable from BFE).
QA/QC procedures to be applied:	At least two sources have to be named for justification of the value. Always the lower value has to be chosen to be conservative.
Any comment:	

Data / Parameter:	$n_{distributed\ kits}$
Data unit:	
Description:	Number of totally distributed kits through the project.
Source of data to be used:	Sales record.
Value of data	
Description of measurement methods and procedures to be applied:	Totally sold kits through the project. The goal is to distribute a minimum of 5500 kits. This value will be renewed every year.
QA/QC procedures to be applied:	LSVW will do the collection of the data and the maintenance of the sales record. myclimate will verify this data.
Any comment:	

Data / Parameter:	$n_{tap\ sh}$
Data unit:	

Description:	Cluster size for cluster tap sh
Source of data to be used:	User survey
Value applied for first 3 years:	63
Description of measurement methods and procedures to be applied:	See B.6.4.1 Ex-ante emission reduction and Annex 5 User survey. This value will be renewed every two years.
QA/QC procedures to be applied:	LSVW will do the collection of the data and the maintenance of the sales record. myclimate will verify this data.
Any comment:	

Data / Parameter:	$n_{tap\ only}$
Data unit:	
Description:	Cluster size for cluster tap only
Source of data to be used:	Sales record.
Value applied for first 3 years:	29
Description of measurement methods and procedures to be applied:	See B.6.4.1 Ex-ante emission reduction and Annex 5 User survey. This value will be renewed every two years.
QA/QC procedures to be applied:	LSVW will do the collection of the data and the maintenance of the sales record. myclimate will verify this data.
Any comment:	

Data / Parameter:	$n_{sh\ only}$
Data unit:	
Description:	Cluster size for cluster sh only
Source of data to be used:	Sales record.
Value applied for first 3 years:	6
Description of measurement methods and procedures to be applied:	See B.6.4.1 Ex-ante emission reduction and Annex 5 User survey. This value will be renewed every two years.
QA/QC procedures to be applied:	LSVW will do the collection of the data and the maintenance of the sales record. myclimate will verify this data.
Any comment:	

Data / Parameter:	n_{NA}
Data unit:	
Description:	Cluster size for cluster NA
Source of data to be used:	Sales record.
Value applied for first 3 years:	124
Description of measurement methods and procedures to be applied:	See B.6.4.1 Ex-ante emission reduction and Annex 5 User survey. This value will be renewed every two years.
QA/QC procedures to be applied:	LSVW will do the collection of the data and the maintenance of the sales record. myclimate will verify this data.
Any comment:	

Data / Parameter:	$ER_{y,avg.per\ kit,\ tap\ sh}$
Data unit:	tCO_{2eq}
Description:	Average emission reduction per kit per year if the shower saver and at least one tap valve is installed for users with fossil fuel heating (for cluster tap sh)
Source of data to be used:	User survey
Value applied for first 3 years:	0.72612
Description of measurement methods and procedures to be applied:	See B.6.4.1 Ex-ante emission reduction and Annex 5 User survey. This value will be renewed every two years.
QA/QC procedures to be applied:	The answers of the survey flow into an automatically generated excel sheet. LSVW will do the collection of the data. myclimate will verify this data and support LSVW with the statistical analyses.
Any comment:	

Data / Parameter:	$ER_{y,\ avg.per\ kit,\ tap\ only}$
Data unit:	tCO_{2eq}
Description:	Average emission reduction per kit per year if at least one tap valve is installed but not the shower saver for users with fossil fuel heating (for cluster tap only)
Source of data to be used:	User survey
Value applied for first 3 years:	0.25855
Description of measurement methods and procedures to be applied:	See B.6.4.1 Ex-ante emission reduction and Annex 5 User survey. This value will be renewed every two years.
QA/QC procedures to be applied:	The answers of the survey flow into an automatically generated excel sheet. LSVW will do the collection of the data. myclimate will verify this data and support LSVW with the statistical analyses.
Any comment:	

Data / Parameter:	$ER_{y,\ avg.per\ kit,\ sh\cdot only}$
Data unit:	tCO_{2eq}
Description:	Average emission reduction per kit per year if the shower saver is installed but no tap valve for users with fossil fuel heating (for cluster sh only)
Source of data to be used:	User survey
Value applied for first 3 years:	0.08041
Description of measurement methods and procedures to be applied:	See B.6.4.1 Ex-ante emission reduction and Annex 5 User survey. This value will be renewed every two years.
QA/QC procedures to be applied:	The answers of the survey flow into an automatically generated excel sheet. LSVW will do the collection of the data. myclimate will verify this data and support LSVW with the statistical analyses.
Any comment:	

Data / Parameter:	$ER_{y,\ avg.per\ kit,\ NA}$

Data unit:	tCO_{2eq}
Description:	Average emission reduction per kit per year for households that haven't installed any of the project equipment or do not have fossil heating or claim a drastically decrease in comfort or don't reply in a correct manner.
Source of data to be used:	User survey
Value of data	0
Description of measurement methods and procedures to be applied:	See B.6.4.1 Ex-ante emission reduction and Annex 5 User survey. This value will be renewed every two years.
QA/QC procedures to be applied:	The answers of the survey flow into an automatically generated excel sheet. LSVW will do the collection of the data. myclimate will verify this data and support LSVW with the statistical analyses.
Any comment:	

B.7.2 Description of the monitoring plan:

Continuous monitoring
Every year the emission reduction through the project over the last monitoring period will be recalculated and reported in a monitoring report.

The number of totally distributed kits $n_{distributed\ kits}$ has to be monitored over the whole project live time.

Renewal of crucial parameters every two years
Every two years a new simplified user survey with 222 households shall be performed to update the level of installation of the kit and to modernize the share of the different clusters. The following parameters therefore have to be renewed:

- $n_{tap\ sh}$
- $n_{tap\ only}$
- $n_{sh\ only}$
- n_{NA}

Also every two years the average flow of the shower and tap water in the absence of the project in Switzerland shall be renewed (evolving baseline) by identifying it in actual reliable studies and/or publications (preferable from BFE). And therefore also the average emission reduction per kit per cluster has to be recalculated.

- $Q_{BL\ Sh}$
- $Q_{BL\ Tap}$
- $ER_{y,avg.per\ kit,\ tap\ sh}$
- $ER_{y,\ avg.per\ kit,\ tap\ only}$
- $ER_{y,\ avg.per\ kit,\ sh\cdot only}$
- $ER_{y,\ avg.per\ kit,\ NA}$

The emission reduction calculation has to be done according the following formula:

$$ER_y = \frac{n_{distributed\ kits}}{n_{sample}}\left(ER_{y,avg\ per\ kit\ tap\ sh} * n_{tap\ sh} + ER_{y,avg\ per\ kit\ tap\ only} * n_{tap\ only} + ER_{y,avg\ per\ kits\ h\ only} * n_{sh\ only} + 0\right)$$

B.8 Date of completion of the application of the baseline and monitoring methodology and the name of the responsible person(s)/entity(ies)

30 May 2011, Martin Jenk, myclimate

SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

1st May 2009

C.1.2. Expected operational lifetime of the project activity:

14 Years

C.2 Choice of the crediting period and related information:

C.2.1. Renewable crediting period

C.2.1.1. Starting date of the first crediting period:

Not applicable

C.2.1.2. Length of the first crediting period:

Not applicable

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

1st May 2009

C.2.2.2. Length:

7 Years, until 30 April 2016. With the possibility of a second crediting period of 7 years after successful revalidation.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Locher, Schmill, Van Wezemael & Partner AG
Street/P.O.Box:	Mühlenplatz 4
City:	Luzern
State/Region:	Luzern
Postfix/ZIP:	6004
Country:	Switzerland
Telephone:	+41 (0)41 249 40 00
FAX:	+41 (0)41 249 40 01
URL:	http://www.comm-care.ch/
Represented by:	Reto Locher
Title:	Senior Consultant and Member of the company management
Salutation:	
Last Name:	Locher
First Name:	Reto
Direct tel:	0 041 41 249 40 00
Personal E-Mail:	locher@comm-care.ch

Organization:	myclimate
Street/P.O.Box:	Sternenstrasse 12
City:	Zürich
State/Region:	Zürich
Postfix/ZIP:	8002
Country:	Switzerland
Telephone:	+41 (0)44 500 43 50
FAX:	+41 (0)44 500 43 51
URL:	www.myclimate.org
Represented by:	Martin Jenk
Title:	Project Manager
Salutation:	
Last Name:	Jenk
First Name:	Martin
Direct tel:	+41 (0)44 500 43 62
Personal E-Mail:	martin.jenk@myclimate.org

Annex 2

FINANCIAL PLAN

Kostenpunkt	Kosten [CHF]
Total Projektleitung	**36'000**
Aufwand für 5500 Wassersparsets. Annahme: 8 Gemeinde à 900 Haushalte Gemeinden	
Auswahl der Gemeinde, Kontaktaufnahme & erste Abklärungen	310
Besprechungen mit dem Gemeindeverteter	1'650
Unklarheiten/Rückfragen	310
Konzept und Umsetzung	3'225
Rücksprache und Konzept überarbeiten	930
Ausarbeiten spezieller Drucksachen	1'240
Offerten einholen	155
Drucksachen & Stand	1'625
1 Standaktion in der Gemeinde	10'640
Miete Marktstand	100
Dekoration (Tischtücher)	50
Miete Lieferwagen	350
Hotline & falls nötig Hilfe bei Installation	1'240
Berichterstattung Gemeinde und Myclimate	620
Total je 1 Gemeinde (ohne Wassersparsets)	***22'445***
Total für 8 Gemeinden	**179'560**
Total Medienarbeit	**26'850**
Monitoring	
Befragungsformulare für Erhebung beim Kauf erarbeiten	1240
Jährliches Monitoring	92'625
Kostenanteil Neoperl: 15'000	-15'000
Wettbewerbspreise plus Gadgetsaktion(en)	6'400
Total Monitoring	**85'265**
Sachmittel (Wassersparsets)	
Einkauf Wassersparsets	162250
Mehrwertsteuer	
Einnahmen beim Verkauf der Sets (50'000 zur Refinanzierung)	-27500
Total Einkauf Wassersparsets	**134'750**
Kosten für Vorfinanzierung von Sachkosten und Arbeitsleistung von CHF 500'000	**47'000**
TOTAL Projektkosten insgesamt über 7 Jahre inkl. MwSt.	**-509'425**

Annex 3

BASELINE INFORMATION

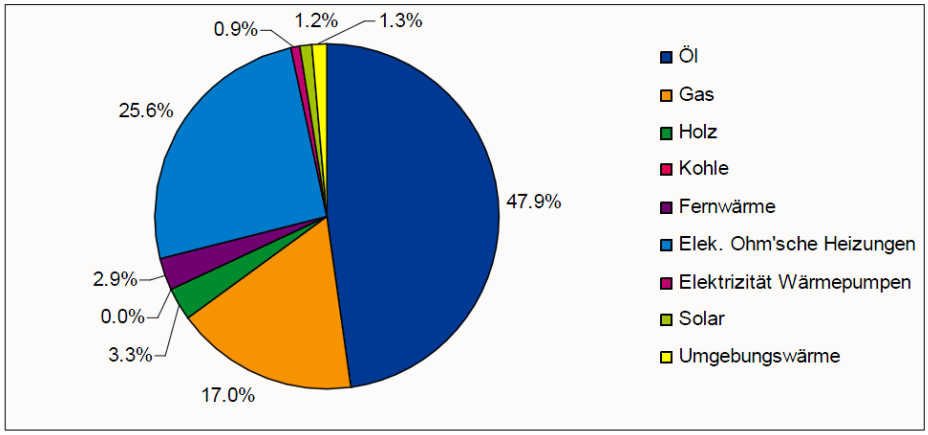

Abbildung 4.3 Private Haushalte: Aufteilung des Energieverbrauchs 2006 zur Bereitstellung von Warmwasser nach Energieträgern.

'Analyse des schweizerischen Energieverbrauchs 2000- 2006 nach Verwendungszwecken, BFE'

Annex 4

ORDERING FORM

Backside of ordering form

Annex 5

USER SURVEY

While purchasing a water saving kit, all buyers have to fulfill a flyer with personal data (see Annex 4). All the following data is collected in a sales record as far as available:

- Name of the buyer
- Address of the buyer
- E-mail address of the buyer
- Date, location of the purchase and signature of the buyer

All buyers are informed at the point of sale that they will be eventually contacted during the project period to participate the monitoring by filling out a web based survey.

The sales record can either consist of a completed excel sheet with all names and available data of the buyers or simply as the collection of all filled flyers.

Randomly selected participants will be contacted by email to fill out the monitoring survey (a web based randomizer as e.g. http://www.randomizer.org/form.htm shall be used if the sales record consists of an excel sheet). A minimum of 3% surveys of all distributed kits has to be returned correctly. If this number isn't achieved, more participants have to be contacted. If the system with the web based surveys doesn't fulfill the expectations other ways to contact the beneficiaries can be used like telephone or mail.
The web address to the web based survey can be requested at LSVW or myclimate (see also the questionnaire in Annex 5).

The following questions are asked in the survey to get all needed information:

****

1. *Is your water saving kit or parts of it installed?*
    a. *Yes*
    b. *No*

****

The kit or parts of it are installed:

2. *What energy source for water heating do you use:*
    a. *oil*
    b. *gas*
    c. *electricity*
    d. *solar*
    e. *other*

3. *, How many persons in your household do use the kit?'*

****

4. *Do you use the valve for the shower?*
    a. *Yes, saving valve(s) for the shower(s) are in use*
    b. *No, no saving valve for any shower is in use*

****

The saving valve for the shower is in use

5. *'How many times a week do the users of the kit in your household take a shower?'*

6. *'How long do the users of the kit in your household take a shower in average?*

7. *'Has the behavior of the users of the kit in your household changed?*
    a. *Yes, the duration and/or the temperature of the shower have decreased.*
    b. *No, the duration and/or the temperature of the shower are the same.*
    c. *Yes, the duration and/or the temperature of the shower have significantly increased through the installation of the kit.* (This answers will be counted half in the ER calculation)

8. *Has the comfort changed through the installation of the saving valve for the shower?*
    a. *The comfort has increased*
    b. *The comfort is the same or little worse.*
    c. *The comfort is drastically worse.* (This answers will be excluded from the emission reduction calculation)

****

9. *Do you use saving valves for tap water?*

****

The saving valve for at least one the tap is in use

10. *'How long does each user of the kit in your household use the HOT tap water per day in average?'*

To check the behavior of the users, question 7 asks if the temperature or the duration of the shower has changed significantly. Users with the answer 7b (increase in temperature and/or duration) will only be counted half in the ER calculation.
To check changes in comfort, question 8 asks whether comfort has increased, decrease or remained the same. The project is only eligible for users without a drastically decrease in comfort.
All results are then collected automatically in an excel sheet. For each kit/household the emission reductions can be calculated according the formula under 6.3.

The survey below is the latest version available for validation. If the monitoring leads to new findings the survey can be adapted/improved, e.g. formatting, layout, text. However this has to be done following the guidelines described in this PDD.

Wasser- und Energie-Sparsets

Sehr geehrte Damen und Herren

Sie haben im Rahmen der Aktion «Wasser sparen fürs Klima» ein Wasser- und Energie-Sparset zum Aktionspreis gekauft. Dieser Aktionspreis war möglich dank der Zusammenarbeit mit der Klimastiftung myclimate (www.myclimate.org).

Damit myclimate die eingesparte Menge CO2 berechnen und die finanzielle Unterstützung gewähren kann, bitten wir einige zufällig ausgewählte Käuferinnen und Käufer (Stichprobe) um das Ausfüllen eines kurzen Fragebogens.

Wir möchten Sie deshalb bitten, sich 3-4 Minuten Zeit zu nehmen und die folgenden Fragen zu beantworten. Die Befragung ist anonym!

Wir danken Ihnen herzlich für Ihre Unterstützung!
Ihr MeinKlimatag-Team (www.meinklimatag.ch)

* Erforderlich

Start des Fragebogens

Haben Sie das «Wasser sparen fürs Klima»-Sparset oder Teile davon eingebaut? *

- ○ Ja
- ○ Nein

Weiter »

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Missbrauch melden - Nutzungsbedingungen - Zusätzliche Bestimmungen

Wasser- und Energie-Sparsets

* Erforderlich

Das Sparset oder Teile davon sind eingebaut

Wie wird bei Ihnen das Warmwasser erhitzt? *

- mit Öl
- mit Erdgas
- mit Strom
- mit Sonne
- mit etwas anderem

Wie viele Personen in Ihrem Haushalt benutzen das Sparset oder Teile davon? *

- 1
- 2
- 3
- 4
- 5
- Sonstiges:

« Zurück | Weiter »

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Missbrauch melden - Nutzungsbedingungen - Zusätzliche Bestimmungen

Wasser- und Energie-Sparsets

* Erforderlich

Haushalt mit 1 Person; Spardüse für Dusche

Verwenden Sie die Spardüse(n) für die DUSCHE(N)? *

- Ja, Spardüse(n) für die Dusche(n) sind in Verwendung
- Nein, es sind KEINE Spardüse(n) für die Dusche(n) in Verwendung

« Zurück | Weiter »

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Missbrauch melden - Nutzungsbedingungen - Zusätzliche Bestimmungen

Wasser- und Energie-Sparsets

* Erforderlich

Haushalt mit 2 und mehr Personen; Spardüse für Dusche

Verwenden Sie Spardüse(n) für die DUSCHE(N)? *

- Ja, Spardüse(n) für die Dusche(n) sind in Verwendung
- Nein, es sind KEINE Spardüse(n) für die Dusche(n) in Verwendung

« Zurück | Weiter »

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Missbrauch melden - Nutzungsbedingungen - Zusätzliche Bestimmungen

Wasser- und Energie-Sparsets

* Erforderlich

Haushalt mit 1 Person; Nutzverhalten Dusche

Wie oft benützen Sie die Dusche mit eingebauter Spardüse? *

- 1x pro Woche
- 2x pro Woche
- 3x pro Woche
- 4x pro Woche
- 5x pro Woche
- 6x pro Woche
- 7x pro Woche
- 8x pro Woche
- 9x pro Woche
- 10x pro Woche
- 11x pro Woche
- 12x pro Woche
- 13x pro Woche
- 14x pro Woche

Wie lange duschen Sie durchschnittlich? *
in Minuten pro Dusche

bitte hier klicken und auswählen

Hat sich Ihr Duschverhalten seit dem Einbau der Spardüse verändert? *

- Ja, ich dusche deutlich KÜRZER und/oder KÄLTER als vorher.
- Nein, Länge und Temperatur beim Duschen sind gleich geblieben.
- Ja, ich dusche deutlich LÄNGER und/oder WÄRMER als vorher.

Hat sich der Komfort beim Duschen seit dem Einbau der Spardüse verändert? *

- Der Komfort ist besser geworden.
- Der Komfort ist gleich geblieben oder hat nur leicht abgenommen.
- Der Komfort hat sich drastisch verschlechtert.

« Zurück | Weiter »

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Missbrauch melden - Nutzungsbedingungen - Zusätzliche Bestimmungen

Wasser- und Energie-Sparsets

* Erforderlich

Haushalt mit 2 und mehr Personen; Nutzverhalten Dusche

Wie oft benützen die Mitglieder Ihres Haushalts die Dusche mit eingebauter Spardüse? *

- 1x pro Woche und Person
- 2x pro Woche und Person
- 3x pro Woche und Person
- 4x pro Woche und Person
- 5x pro Woche und Person
- 6x pro Woche und Person
- 7x pro Woche und Person
- 8x pro Woche und Person
- 9x pro Woche und Person
- 10x pro Woche und Person
- 11x pro Woche und Person
- 12x pro Woche und Person
- 13x pro Woche und Person
- 14x pro Woche und Person

Wie lange duschen die Mitglieder Ihres Haushalts durchschnittlich? *
in Minuten pro Dusche und Person

Bitte hier klicken und auswählen

Hat sich das Duschverhalten der Mitglieder Ihres Haushalts seit dem Einbau der Spardüse verändert? *

- Ja, wir duschen deutlich KÜRZER und/oder KÄLTER als vorher.
- Nein, Länge und Temperatur beim Duschen sind gleich geblieben.
- Ja, wir duschen deutlich LÄNGER und/oder WÄRMER als vorher.

Hat sich der Komfort beim Duschen seit dem Einbau der Spardüse verändert? *

- Der Komfort ist besser geworden.
- Der Komfort ist gleich geblieben oder hat nur leicht abgenommen.
- Der Komfort hat sich drastisch verschlechtert.

« Zurück | Weiter »

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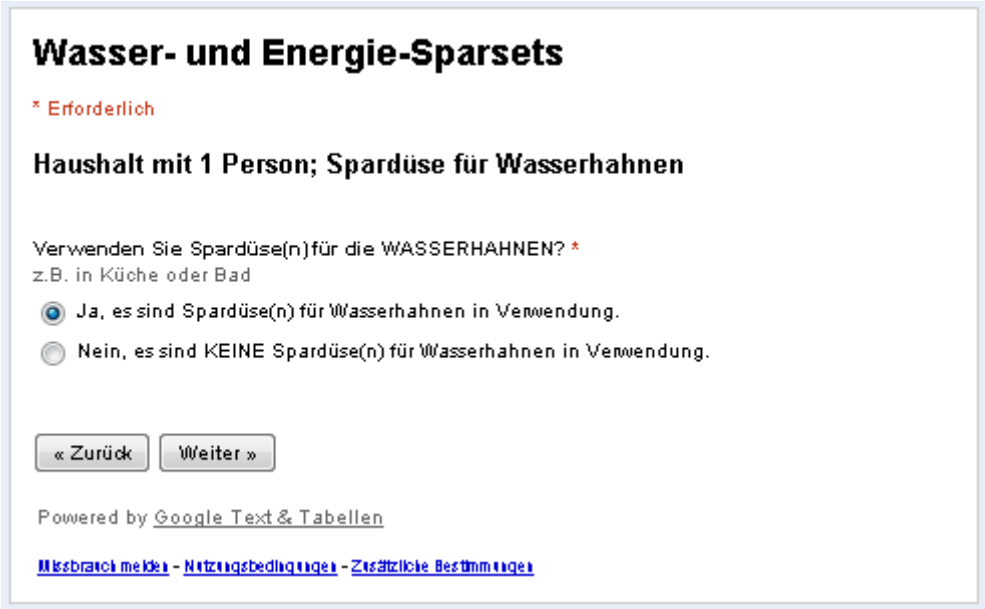
Missbrauch melden - Nutzungsbedingungen - Zusätzliche Bestimmungen



Wasser- und Energie-Sparsets

* Erforderlich

Haushalt mit 1 Person; Spardüse für Wasserhahnen

Verwenden Sie Spardüse(n) für die WASSERHAHNEN? *
z.B. in Küche oder Bad

- (•) Ja, es sind Spardüse(n) für Wasserhahnen in Verwendung.
- ( ) Nein, es sind KEINE Spardüse(n) für Wasserhahnen in Verwendung.

« Zurück | Weiter »

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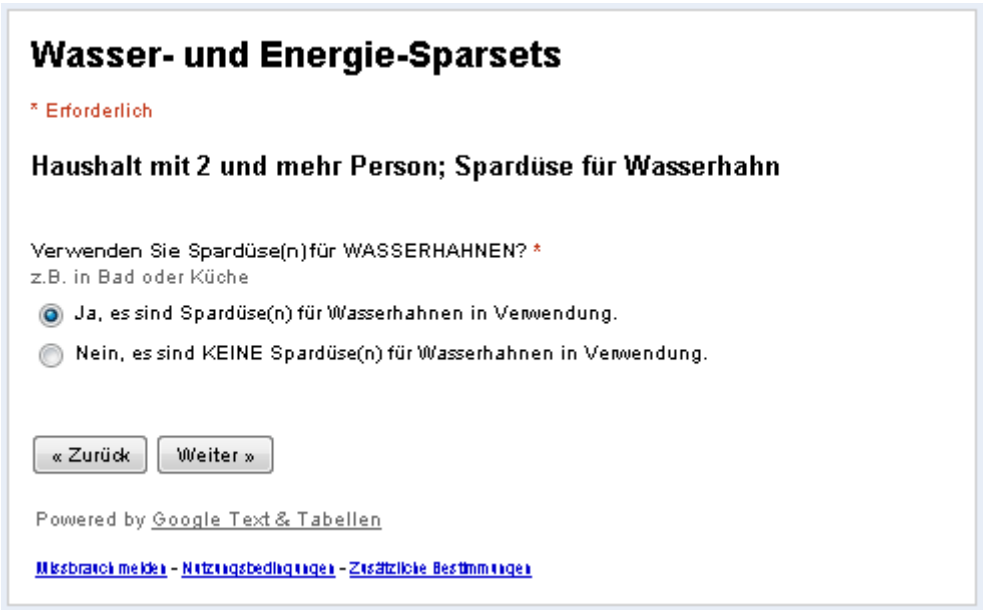
Missbrauch melden - Nutzungsbedingungen - Zusätzliche Bestimmungen



Wasser- und Energie-Sparsets

* Erforderlich

Haushalt mit 2 und mehr Person; Spardüse für Wasserhahn

Verwenden Sie Spardüse(n) für WASSERHAHNEN? *
z.B. in Bad oder Küche

- (•) Ja, es sind Spardüse(n) für Wasserhahnen in Verwendung.
- ( ) Nein, es sind KEINE Spardüse(n) für Wasserhahnen in Verwendung.

« Zurück | Weiter »

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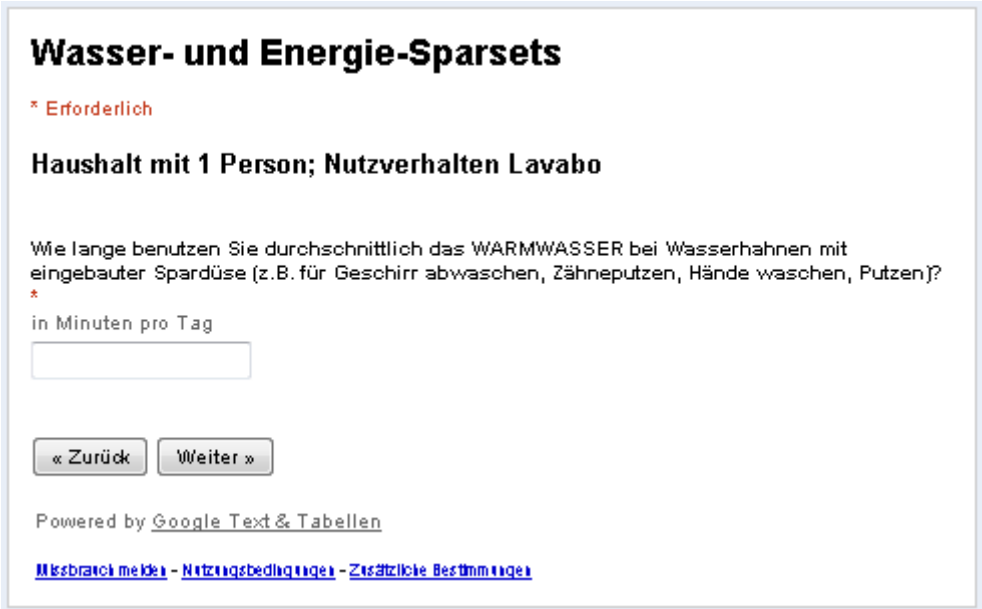
Missbrauch melden - Nutzungsbedingungen - Zusätzliche Bestimmungen



Wasser- und Energie-Sparsets

* Erforderlich

Haushalt mit 1 Person; Nutzverhalten Lavabo

Wie lange benutzen Sie durchschnittlich das WARMWASSER bei Wasserhahnen mit eingebauter Spardüse (z.B. für Geschirr abwaschen, Zähneputzen, Hände waschen, Putzen)? *

in Minuten pro Tag

« Zurück | Weiter »

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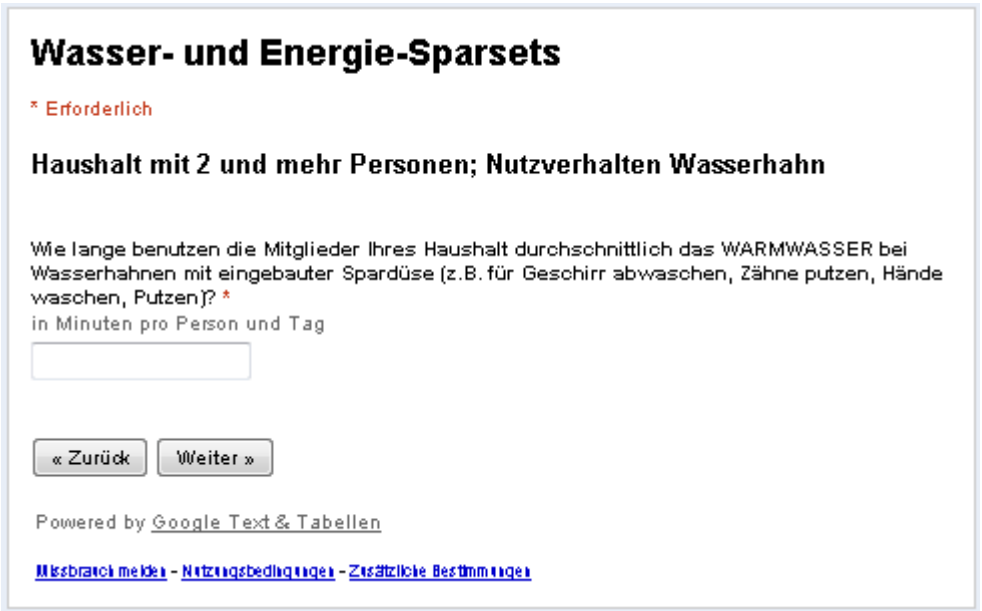
Missbrauch melden - Nutzungsbedingungen - Zusätzliche Bestimmungen



Wasser- und Energie-Sparsets

* Erforderlich

Haushalt mit 2 und mehr Personen; Nutzverhalten Wasserhahn

Wie lange benutzen die Mitglieder Ihres Haushalt durchschnittlich das WARMWASSER bei Wasserhahnen mit eingebauter Spardüse (z.B. für Geschirr abwaschen, Zähne putzen, Hände waschen, Putzen)? *

in Minuten pro Person und Tag

« Zurück | Weiter »

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Missbrauch melden - Nutzungsbedingungen - Zusätzliche Bestimmungen

Wasser- und Energie-Sparsets

Das Sparset ist nicht eingebaut.

Ich/wir haben das Sparset aus folgenden Gründen nicht eingebaut:

« Zurück | Weiter »

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Missbrauch melden - Nutzungsbedingungen - Zusätzliche Bestimmungen

Wasser- und Energie-Sparsets

Bemerkungen

Sie haben bereits alle Fragen beantwortet. Möchten Sie uns noch etwas mitteilen? Hier finden Sie Platz dafür.
Bitte klicken Sie danach auf «senden».

« Zurück | Senden

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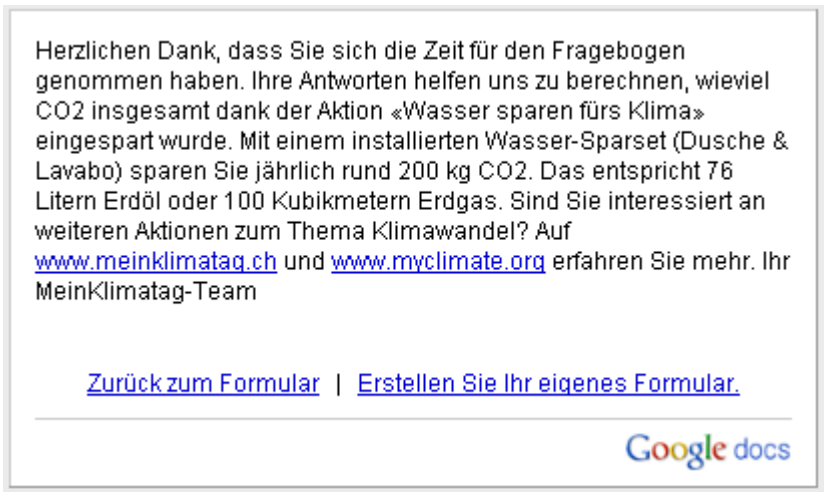
Missbrauch melden - Nutzungsbedingungen - Zusätzliche Bestimmungen



Herzlichen Dank, dass Sie sich die Zeit für den Fragebogen genommen haben. Ihre Antworten helfen uns zu berechnen, wieviel CO2 insgesamt dank der Aktion «Wasser sparen fürs Klima» eingespart wurde. Mit einem installierten Wasser-Sparset (Dusche & Lavabo) sparen Sie jährlich rund 200 kg CO2. Das entspricht 76 Litern Erdöl oder 100 Kubikmetern Erdgas. Sind Sie interessiert an weiteren Aktionen zum Thema Klimawandel? Auf www.meinklimatag.ch und www.myclimate.org erfahren Sie mehr. Ihr MeinKlimatag-Team

Zurück zum Formular | Erstellen Sie Ihr eigenes Formular.

Google docs

Annex 6

JUSTIFICATION OF HOT TAP WATER CONSUMPTION, PARAMETER t_{tap}

An outcome of the 1st validation and the 1st verification was that the value of the parameter t_{tap} has been seen as too high by the auditor compared to available water consumption studies in Switzerland.
The parameter has been defined with the help of a user survey (see Annex 5) by asking a sample of users the following question:

'How long does each user of the kit in your household use the HOT tap water per day in average?'

An outcome of the first verification is the Forward Action Request FAR #04 asking to review the reliability of the monitoring result of t_{tab} and cross-references prior to the next monitoring and include it in a new PDD version.
Therefore the following clarifications have to be performed and re-validated before the next verification:

- A discussion about the available studies shall outline whether the result of the user survey differs significantly from the cross-references or not.
- A more detailed user survey about the hot tap water consumption shall be conducted during the next monitoring to give more confidence to value $t_{tap.}$

Discussion and comparison of value t_{tap} to available studies.

The available studies on water consumption in Switzerland have uncertainties in the following respects that are considered in detail below:

- The reliability of the total consumption per household
- The reliability of the share of different applications (e.g. shower, washing, dish washing)
- The plausibility of these values with respect to the installed boiler capacity

The reliability of the total consumption per household

The most cited study referring to this is the water consumption statistic of the Swiss Association of the gas and water profession (SVGW). This is an association under private law that brings together Switzerland's gas and water distributors. The statistic is updated yearly and provides data for the last 100 years.
With data from a survey with 25 households in the early 80's the SVGW together with the BUWAL calculated the share of different applications of the total water consumption. (Wasserverbrauch im Haushalt, SVGW)
Time series over such a long period are problematic as the method of data collection and also consumption patterns change considerably within a century. As an example, hundred years ago, toilet flushing was at an early stage of development and the first woody flushing tanks just started being produced. At that time the coverage with flushing system was far from being comprehensive. (www.geberit.com).
The introduction of showers only took place during the construction boom in the 1950s/1960s. This means that water consumption patterns have seen a number of fundamental changes and also changing survey methodology in the last 100 years that cannot be tracked anymore. Furthermore, the sometimes restrictive institutional framework with respect to data collection may have caused errors in the results.
Concretely, the SVGW statistic reports water consumption of 162 litres per day and person in 2006. This is an average value, which includes both rural and alpine regions and urban centres like Zurich. In the urban areas the water consumption per person is significantly higher.
Basel's public utility company (IWB) reports an average consumption of 200 litres per person and day; Zurich's public utility company (ewz) reports a value of 220 litres per person for the same year.

According to the annual report of the relevant public utility company of Lucerne (ewl) the average water consumption is at 180 litres per person and day (www.ewl-luzern.ch).
The average values are in the range of 162-220 litres, whereas the consumption in urban areas is clearly higher than in rural areas. Furthermore, it has to be stated that this is an average value and individual disparities are significant. Onsite measurement (ewl Sälihalde 21 Luzern) found an average consumption of 110 litres/person/day in a three person household. This means that with an average of 180 litres other families may consume 250 litres.
Based on this information the 162 litres of SVGW for the urban project area of Lucerne are too low.

The reliability of the share of different applications (e.g. shower, washing, dish washing)

Again the SVGW statistic appears to have some shortfalls. Especially, the study on the share of different applications of total water consumption was produced over thirty years ago.
Alone because of technological progress in toilet flushing systems and changing behaviour the relevance of this data should be put into question. For example, "cloth washing" amounts to 30l/person/day. According to a recent market survey a washing machine consumes around 50 litres for one cycle. www.testberichte.de/testsieger/level3_grosse_haushaltgeraete_waschmaschinen_537.html).
Combining this information, a family of four would need to wash 2.5 times per day (4x30litres = 120 litres = 2.5 cycles). This would result in 17 washing cycles per week! This is clearly an overestimation of the share of cloth washing.
If these 30 litres in the SVGW statistic are too high -say around 10-15 litres too high – this amount has to be allocated to another application.
Similar applies to the water consumption for the use of toilets: the SVGW statistics reports 42 litres with the assumption that the toilet is used three times per day and that 14 litres are flushed per usage. However, todays flushing systems only need between 4 litres (economic mode) and 6 litres (normal mode). (www.geberit.com).
Taking this into account, this results in 14 litres (2x4l +1x6l) per person and day or 28 litres less then reported in the SVGW statistic. Therefore, the difference has to be allocated to another application.
For the usage of the tab the SVGW statistic reports 44 litres per person per day. Assuming the above mentioned changes in water use for the toilet and cloth washing, 28 litres from savings in usage for the toilet flushing and 15 litres from savings in cloth washing are allocated to tab usage. The amount of water consumed from the tab would be at 87 litres corresponding to our monitoring results which were 88 litres without and 80 including statistical adjustments.
If one does the calculation with the 180 litres from Lucerne 'Elektrizitätswerke Luzern' (ewl) instead of the 162 litres from SVGW one can add another 18 litres to either tab usage or showering.

The plausibility of these values with respect to the installed boiler capacity

Based on our monitoring results we obtain a value of 130 litres water consumption per day for the tab and the shower (80 litres tab and 50 litres shower; statistically adjusted). This corresponds to a hot water consumption of 65 litres per person per day.
According to the statistic of the 'Verband Schweizerischer Elektrizitätsunternehmen' (VSE) the average consumption in Switzerland is at 51 litres. Here again, people in the urban areas probably consume more than people in rural areas. If one does a comparison with total water consumption (162 litres average consumption in Switzerland vs. 220 litres in Zurich) and applies this relation to the hot water consumption, one gets a hot water consumption of 69 litres for Zurich. Taking this into account the monitored value of 65 litres seems appropriate and does not require further explanation.
If one looks at the information sheet for the design of solar panel systems (805.161.3 d) provided by the Federal Agency for Energy (BFE), 35 -60 litres hot water consumption are used for the calculation. Added to this is a safety margin of 20%-30% (page 4), what corresponds to a hot water demand of 45-70

litres per day. For the dimension of the boiler (page 4 at the bottom) an amount of 80-120 litres per person per day is recommended. Therefore, the 65 litres hot water consumption obtained from the monitoring are within a reasonable range regarding the boiler capacity.
To finalize, the newest BFE publication on water saving is referenced. In March 2011 the special edition on water saving for house owners was published. Even though it does not contain statistic information it contains indications that the calculated numbers and their underlying assumptions are valid. As an example the BFE partner Coop presents its newest A-class shower head "eco-booster". This shower head consumes only 8 litres/minute in its most economic mode (compared to 9 litres/minute of our shower heads). In the "booster-mode" the shower head needs 22 litres/minute (compared to 18 litres/minute in our baseline). Furthermore, two indications for a high share of the tab usage can be found: "Often, a lot of hot water is used in the kitchen" and "until hot water is flowing the hands are already clean"

Detailed monitoring survey t_{tap}

As discussed above a supplementary survey for t_{tap} will be conducted. The outcome of the survey shall be a verified value for parameter t_{tap}. Also it has to be demonstrated that a significant proportion of the household hot water consumption is covered with the saving equipment. The survey will be conducted through telephone calls with project participants to get the most appropriate answers. The chosen sample size is 100.
To get a better understanding of the different users and their hot water consumption behaviour and to verify the value of t_{tab} the following questions will be asked:

1) General behaviour
    a) How many water saving valves are installed in your household and where?
    b) How many **taps serving hot water are** in use in your household having **no saving valve** installed?
2) Usage behaviour in kitchen
    a) **How long** do the users in your household turn the hot water on in the kitchen in average (for each single use)?
    b) **How many times** a day do the users in your household turn on the hot water tap in the kitchen in average?
    c) When doing the washing up, do you use a stopper or 'flowing water'?
3) Usage behaviour in bathroom
    a) **How long** do the users in your household turn the hot water on in the bath room in average (for each single use)?
    b) **How many times** a day do the users in your household turn on the hot water tap in the bathroom in average?**How many baths** take member of you household per week in average?
    c) Are there **showers in regular use** in your household where **no saving valve** is installed?

All answers will be analysed and discussed with the verifying body. A new mean value for t_{tap} will be calculated based on answers 2a) 2b) 3a) 3b), however this new value will only be used for crosschecking with the value of the main user survey and with data from literature.
Should the new value t_{tab} significantly differ from the value out of the main user survey or should the outcome be that not a significant part of the hot water consumption is covered through the saving

equipment, further measures will have to be introduced based on discussion (real measuring, use of values from literature, adjustment factor) for next verification or next project implementation or only after re validation (also to be discussed).
Should on the other hand the new value t_{tab} not significantly differ from the value out of the main user survey and it can be demonstrated that a significant part of the hot water consumption per household is covered through the saving equipment, the data for t_{tab} out of the main user survey will be approved as correct and applicable.
The outcome of the discussion will be documented in the next monitoring report.